

**TU4A Millimeter-Wave Monolithic Circuits***Joint RFIC and IMS Session**Chair: H.A. Hung, TRW**Co-chair: S.S. Bharj,**Princeton Microwave Technology*

ROOM A201

**TU4B Passive Components I***Chair: W.-C. Tang,**COM DEV*

ROOM A207

**TU4C Superconductive Technology***Chair: W.G. Lyons,**MIT Lincoln Laboratory*

ROOM A102

**TU4D Numerical Methods  
in Time Domain II***Chair: P. Russer,**University of Technology, Munich*

ROOM A101

**TU4E Microwave Photonic Systems  
and Technology***Chair: A. Gopinath,**University of Minnesota**Co-chair: A. Paoletta, Lockheed-Martin*

ROOM A108

3:30 PM **TU4A-1: A 6 Watt Ka-Band Power Module Using MMIC Power Amplifiers**  
D.L. Ingram, D.I. Stone, T.W. Huang, H. Wang, M. Siddiqui, M. Nishimoto, B. Allen, D. Tamura, R. Lai, M. Biedenbender, H.C. Yen, TRW, Inc., ESTD, Redondo Beach, CA

**TU4B-1: Air-Gap Transmission Lines for OEICs and MMICs Using Glass Substrates**  
J. Chaung, S. El-Ghazaly, D. Schroder, Y. Zhang, EE Dept., Arizona State Univ., Tempe, AZ, G. Maracas, A. Reyes, Motorola, Tempe, AZ

**TU4C-1: HTS Diplexer & Low Noise Amplifier RF Module**  
G.L. Hey-Shipton, N.O. Fenzi, K.F. Raihn, Superconductor Tech. Inc., Santa Barbara, CA

**TU4D-1: Special 3D-TLM Corner Models for Singular Field Regions**  
G. Tardiolo, L. Cascio, M. Righi, W.J.R. Hoefer, NSERC/MPR Teltech, Dept. of ECE, Univ. of Victoria, Victoria, B.C., Canada

**TU4E-1: A Wideband, Fiber-Optic, True Time-Steered Array Receiver**  
P.J. Matthews, M.Y. Frankel, R.D. Esman, Naval Research Lab., Washington, DC

3:50 PM **TU4A-2: Compact Integrated Coplanar T/R-Modules for Automotive Applications**  
L. Verweyen, A. Bangert, H. Massler, T. Fink, M. Neumann, R. Osorio, T. Krems, T. Jakobus, W.H. Haydl, M. Schlechtweg, Fraunhofer Inst. for Appl. SS Physics, Freiburg, Germany

**TU4B-2: W-Band Micromachined Finite Ground Coplanar (FGC) Line Circuit Elements**  
K.J. Herrick, T. Schwarz, L.P.B. Katehi, EECS Dept., Univ. of Michigan, Ann Arbor, MI

**TU4C-2: A Novel Split-Resonator High Power HTS Planar Filter**  
S. Ye, R.R. Mansour, COM DEV Ltd., Cambridge, Ontario, Canada

**TU4D-2: Electromagnetic Analysis of Planar Circuitry and the Dimensionality Argument**  
L. Albasha, C.M. Snowden, Dept. of EEE, Univ. of Leeds, Leeds, UK

**TU4E-2: MMIC Based SOM in Optically Fed Phased Array Antennas for Ka-Band Communication Satellites**  
A. Daryoush, K. Kamogawa, K. Horikawa, T. Tokumitsu, H. Ogawa, NTT Wireless Sys. Labs., Yokosuka, Japan

4:10 PM **TU4A-3: A V-Band GaAs MMIC Chip Set on a Highly Reliable WSi/Au Refractory Gate Process**  
J. Mizoe, Y. Akiba, K. Nagai, H. Sato, C&C LSI Dev. Div., T. Matsumura, K. Unosawa, ULSI Device Dev. Labs., T. Saryo, Micro. & Sat. Comm. Div., T. Inoue, Kansai Elec. Labs., NEC Corp., Kawasaki, Japan

**TU4B-3: Uniplanar Hybrid Couplers Using Asymmetrical Coplanar Strip Lines**  
L. Fan, B. Heimer, K. Chang, Dept. of EE, Texas A&M Univ., College Station, TX

**TU4C-3: Tunable Superconducting Resonators on Ferrite Substrates**  
D.E. Oates, G.F. Dionne, MIT Lincoln Lab., Lexington, MA

**TU4D-3: Modal Boundary Conditions for Waveguide of Arbitrary Cross-Section with SCN-TLM**  
J.L. Herring, M. Righi, W.J.R. Hoefer, Univ. of Victoria, Victoria, B. C., Canada

**TU4E-3: Electrical Characterization and Application of Very High Speed Vertical Cavity Surface Emitting Lasers (VCSELs)**  
V.M. Hietala, K.L. Lear, M.G. Armendariz, C.P. Tigges, H.Q. Hou, J.C. Zolper, Sandia Nat'l. Labs., Albuquerque, NM

4:20 PM **TU4A-4: A D-LDD (Double Lightly Doped Drain) Structure H-MESFET for MMIC Applications**  
Y. Yamane, K. Onodera, T. Nittono, K. Nishimura, K. Yamasaki, NTT Sys. Elec. Labs., Kanagawa, Japan, A. Kanda, NTT Wireless Sys. Labs.

**TU4B-4: Improved Compaction of Multilayer MMIC/MCM Baluns Using Lumped Element Compensation**  
R.H. Jansen, J. Jotzo, M. Engels, Aachen Univ. of Tech., EE Dept., Aachen, Germany

**TU4D-4: The TLM-Equivalent FD-TD Analysis of Antenna Radiation Problems with the PML Absorbing Conditions**  
J. Xu, Z. Chen, J. Brown, Dept. of EE, Tech. Univ. of Nova Scotia, Nova Scotia, Canada, B. Davis, Seimac Ltd., Nova Scotia, Canada

4:30 PM

**TU4B-5: A Compact MMIC 90 Degree Coupler for ISM Applications**  
G.F. Avitabile, A. Cidronali, C. Salvador, Univ. of Florence, Florence, Italy

**TU4C-4: Novel Phase Noise Reduction Technique Using HTSC Limiters**  
F. Massin, H. Christange, R. Knochel, Christian-Albrechts-Univ., Kiel, Germany

**TU4D-5: Applications of Multiresolution Based FDTD Multigrad**  
K. Goverdhanam, L.P.B. Katehi, Rad. Lab., Univ. of Michigan, Ann Arbor, MI, A. Cangelaris, Dept. of EE., Univ. of Arizona, Tucson, AZ

**TU4E-4: Optoelectronic Mixing in Three-Terminal InP/InGaAs Heterojunction Bipolar Transistors**  
C.P. Liu, A.J. Seeds, Univ. College London, London, England, Y. Betsler, D. Ritter, A. Madjar, Dept. of EE, Technion, Haifa, Israel

4:40 PM **TU4A-5: Low Phase Noise Ka-Band VCOs Using InGaP/GaAs HBTs and Coplanar Waveguide**  
M.S. Heins, D.W. Barlage, M.T. Fresina, D.A. Ahmari, Q.J. Hartmann, G.E. Stillman, M. Feng, Dept. of ECE, Univ. of Illinois, Urbana-Champaign, IL

**TU4B-6: Arbitrary Termination Impedances, Arbitrary Power Divisions and Small-Sized Ring Hybrids**  
H.R. Ahn, I. Wolff, I.-S. Chang, GM Univ. Duisburg, Duisburg, Germany

4:50 PM

**TU4B-7: Line-to-Ring Coupling Circuit Model and Its Parametric Effects for Optimized Design of Microstrip Ring Circuits and Antennas**  
L. Zhu, POLY-GRAMES Research Ctr., Ecole Polytech. de Montreal, Quebec, Canada, K. Wu, Dept. of EE, City Univ. of Hong Kong, Kowloon, Hong Kong

**TU4C-5: A New High-Temperature Superconducting Double-Hybrid Coupler with Wide Bandwidth**  
T. Bechteler, Univ. of the Army, Neubiberg, Germany, B. Mayer, Inst. for HF Eng., Webling, Germany, R. Weigel, Univ. of Linz, Linz, Austria

**TU4D-6: Space-and Time-Adaptive Gridding Using MRTD Technique**  
E.M. Tentzeris, R.R. Robertson, L.P.B. Katehi, Rad. Lab., Dept. of EECS, Univ. of Michigan, Ann Arbor, MI, A. Cangelaris, Dept. of ECE, Univ. of Arizona, Tucson, AZ

5:00 PM **TU4A-6: 1 Watt, 65% PAE K-Band AlGaAs/GaAs Heterojunction Bipolar Transistors Using Emitter Air-Bridge Technology**  
H.-F. Chau, D. Hill, R. Yarborough, T. Kim, Corp. R&D, Texas Instruments, Inc., Dallas, TX

**TU4D-7: Efficient Arma Modeling of FDTD Time Sequences for Microwave Resonant Structures**  
A.K. Shaw, K. Naishadham, Dept. of Electrical Engr., Wright State Univ., Dayton, OH